

CLAIMS

WHAT IS CLAIMED IS:

1. A light source, comprising:
5 an LED capable of emitting light;
a layer of phosphor material positioned to receive excitation light and emitting
visible light when illuminated with the excitation light; and
interference reflector means for reflecting at least some light emitted by the
LED that has not passed through the phosphor material, onto the layer
10 of phosphor material and transmitting at least some visible light emitted
by the phosphor.
2. A light source, comprising:
a layer of phosphor material;
15 an LED capable of emitting light that excites the phosphor material; and
an interference reflector positioned to reflect at least some light emitted by the
LED that has not passed through the phosphor material, onto the layer
of phosphor material.
- 20 3. The light source according to claim 1 or 2, wherein the layer of phosphor has a
major surface from which light is emitted toward an output end of the light source, and
wherein the light emitted by the LED that has not passed through the layer of phosphor
material is reflected onto the major surface of the layer of phosphor material.
- 25 4. The light source according to claim 2, wherein the reflector substantially
reflects light emitted by the LED and substantially transmits light emitted by the
phosphor material.
5. The light source according to claim 2, wherein the reflector has a planar shape.

6. The light source according to claim 2, wherein the reflector has a non-planar shape.
- 5 7. The light source according to claim 6, wherein the non-planar shape is substantially an ellipsoid, and wherein the LED and the layer of phosphor material are disposed at foci of the ellipsoid.
8. The light source according to claim 2, wherein a first portion of the light
10 emitted by the LED is reflected by the reflector onto a major surface of the layer of phosphor material, and a second portion of the light emitted by the LED impinges on a second major surface of the layer of phosphor material opposed to the first major surface.
- 15 9. The light source according to claim 2, wherein the reflector has the shape of a surface of revolution.
10. The light source according to claim 2, wherein the layer of phosphor material surrounds the LED.
- 20 11. The light source according to claim 2, wherein the layer of phosphor material is segmented into distinct color regions.
12. The light source according to claim 2, wherein the layer of phosphor material is
25 co-planar with the LED.
13. The light source according to claim 2, wherein the layer of phosphor material is not co-planar with the LED.

14. The light source according to claim 2, wherein the layer of phosphor material is a discontinuous layer of phosphor material.

15. The light source according to claim 14, wherein the discontinuous layer of phosphor material is a plurality of lines of phosphor material or a pattern of phosphor material.

16. The light source according to claim 14, wherein the discontinuous layer of phosphor material comprises a plurality of dots of phosphor material.

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17. The light source according to claim 16, wherein the plurality of dots of phosphor material each have an area of less than 10000 microns².

18. The light source according to claim 16, wherein the plurality of dots comprise phosphor material that emits more than one color when illuminated with the excitation light.

19. The light source according to claim 16, wherein the plurality of dots comprise phosphor material that emits red, green and blue light when illuminated with the excitation light.

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20. The light source according to claim 2, wherein the reflector comprises alternating layers of a first and second thermoplastic polymer wherein at least some of the layers are birefringent.

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21. The light source according to claim 18, wherein at least a first phosphor dot emits light at a first wavelength and a second phosphor dot emits light at a second wavelength different than the first wavelength.

22. A method of illuminating phosphor comprising:
providing a layer of phosphor material and an LED capable of emitting light
that excites the phosphor material;
emitting light from the LED toward a reflector to produce LED emitted light;
5 and
reflecting the LED emitted light, at least a portion of which has not passed
through the layer of phosphor material, onto the layer of phosphor
material.
- 10 23. The method according to claim 22, wherein the step of emitting light comprises
emitting light from the LED toward a polymeric reflector to produce LED emitted
light.